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I, JULIE BILLINGSLEY, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2003903142 for a patent by PALMER TUBE MILLS (AUST) PTY LTD as filed on 23 June 2003.

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First day of July 2004

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PROVISIONAL SPECIFICATION

Invention Title: "AN IMPROVED BEAM"

The invention is described in the following statement:

TITLE

"AN IMPROVED BEAM"

FIELD OF THE INVENTION

This invention relates to an improved beam. In particular, the invention relates to a beam constructed using specific dimensions to create a beam with improved weight to strength characteristics.

BACKGROUND OF THE INVENTION

Traditionally, beams have been produced using timber. However, timber that is used to produce high strength beams is very expensive. Further, these types of timber beams are normally produced from hardwood trees that often take over 50 years to reach maturity. Hence, old forests are constantly being felled to supply high strength timber beams. Current demand for high strength timber beam usage far outweighs the available supply and therefore high strength timber beams are not a sustainable resource. Further, timber beams have additional disadvantages such as they are combustible, prone to attack by termites and able to be damaged by water.

Steel beams have therefore become more popular due to their longevity and strength. However, steel beams are normally heavier than timber and therefore more cumbersome to position. Further, a steel beam needs to be drilled to fasten other building elements, to the beam. Drilling is usually completed prior to the beam being installed increasing the overall cost of a steel beam compared to a timber beam.

The cost of a steel beam is dependent on the amount of steel

that is utilised. Hence, the more steel that is used, the more expensive the beam. It is therefore advantageous to produce a beam that has a low weight but high strength.

OBJECT OF THE INVENTION

It is an object of the invention to overcome or alleviate one or more of the above disadvantages or provides the consumer with a useful or commercial choice.

SUMMARY OF THE INVENTION

In one form, although not necessarily the one or broadest form, the invention resides in a beam comprising:

two hollow flanges, each flange constructed from a multiplicity of interconnecting walls; and

a web that interconnects the hollow flanges;

wherein a ratio of the width of the flange compared to the depth between an outer wall of each of the flanges is between the range of 0.15 to 0.4.

The beam may be produced using suitable manufacturing techniques such as hot roll forming, extrusion or fabrication. Preferably, the beam is produced using cold roll forming.

The beam is normally produced from metal. Preferably, the beam is produced using steel.

The metal may be coated using any suitable material and suitable techniques such as galvanising.

The hollow flanges may be polygonal or circular. Preferably, the hollow flanges are rectangular.

Usually, the web is substantially flat. However, stiffeners may be located within the web.

Preferably, the ratio of the width of the flange compared to the depth between an outer edge of each of the flanges is between the range of 0.25 to 0.35. More preferably, ratio of the width of the flange compared to the depth between an outer edge of each of the flanges is between the range of 0.28 to 0.32. Still more preferably, the ratio of the width of the flange compared to the depth between an outer edge of each of the flanges is approximately 0.3.

The ratio of the width of the flange compared to the depth of the flange may be between the range of 1.5 to 4.0. Preferably, the ratio of the width of the flange compared to the depth of the flange is between the range of 2.5 to 3.5. More preferably, ratio of the width of the flange compared to the depth of the flange is between the range of 2.8 to 3.2. Still more preferably, ratio of the width of the flange compared to the depth of the flange is approximately 3.

The web may form one or more of the interconnecting walls of the flanges. Normally, the interconnecting walls of the flanges are of substantially the same thickness. Usually, the web is of the same thickness as the interconnecting walls of the flanges. However, the thickness of the web may vary compared to the thickness of the walls of the flanges.

The ratio of the width of the flange compared to the thickness of the web may be between the range of 15 to 50. Preferably, the ratio of the width of the flange compared to the thickness of the web is between the

range of 25 to 35. More preferably, the ratio of the width of the flange compared to the thickness of the web is between the range 28 to 32. Still more preferably, the ratio if the flange compared to the thickness of the web is approximately 30.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of the invention, by way of example only, will be described with reference to the accompanying drawings in which:

FIG. 1 is perspective view of a beam according to an embodiment of the invention.

FIG. 2 is a side cross-sectional view of the beam according to FIG. 1.

DETAILED DESCRIPTION OF THE PREFFERRED EMBODIMENT

FIGS. 1 and 2 show a beam 10 that has two rectangular flanges 11 that are interconnected by a web 12. The flanges are hollow with walls of the flanges 11 being the same thickness as that of the web 12.

The beam is constructed so that dimensions, as represented in FIG 2 as letter, are proportionate with respect to each. The letters in FIG 2 represent the following dimensions:

d = depth between the outer ends of two flanges

df = depth of the flange

bf = width of the flange

t = thickness of the web

The optimum ratios for calculation dimensions of the beam are as follows:

bf = 0.3d

bf = 3df

bf = 30t

Example 1

A beam, to be formed by extrusion, must have a depth of 300mm. Hence d = 300mm

In accordance with the optimum ratios and d = 300 mm, the dimensions for the beam are as follows:

bf = 90 mm

df = 30 mm

t = 3 mm

Example 2

A beam, to be formed by fabrication in which a flat sheet is welded to two rectangular tubes, must have a width of 45 mm. Hence bf = 45 mm.

In accordance with the optimum ratios and bf = 45 mm, the dimensions for the beam are as follows:

d = 150 mm

df = 15 mm

t = 1.5 mm

Example 3

A cold rolled beam is to be formed from 1.75 mm thick steel sheet. Hence t = 1.75 mm

In accordance with the optimum ratios and t = 1.75 mm, the

dimensions for the beam are as follows:

d = 175 mm

bf = 52.5 mm

df = 17.5 mm

The optimum ratios do not suit the machinery needed to produce the beam. Hence, the ratios were modified slightly as follows:

d = 180 mm

bf = 55 mm

df = 20 mm

It should be appreciated that for certain instance, that is for manufacturing or desired dimensions, the ratios may need to be modified in accordance with specific requirements. However, the optimum ratios are calculated first and necessary changes made from these ratios.

Beams produced using the above ratios provided an optimal weight to strength ratio allow the beam to be produced in a cost effective manner.

It should be appreciated that various other changes and modifications may be made to the embodiments described without departing from the spirit or scope of the invention.

DATED this Twenty-third day of June 2003.

PALMER TUBE MILLS (AUST) PTY LTD

By its Patent Attorneys

FISHER ADAMS KELLY

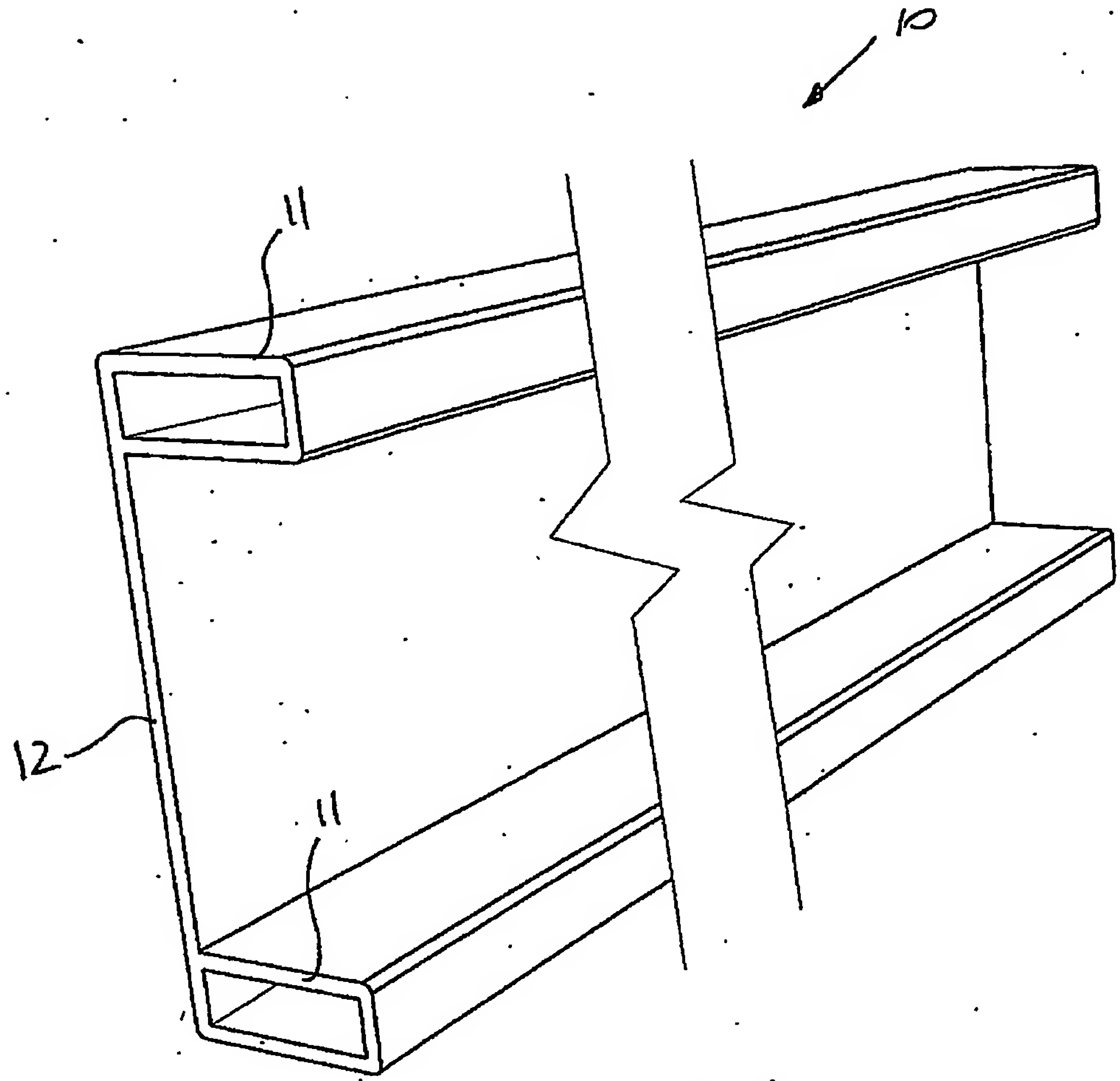

FIG 1

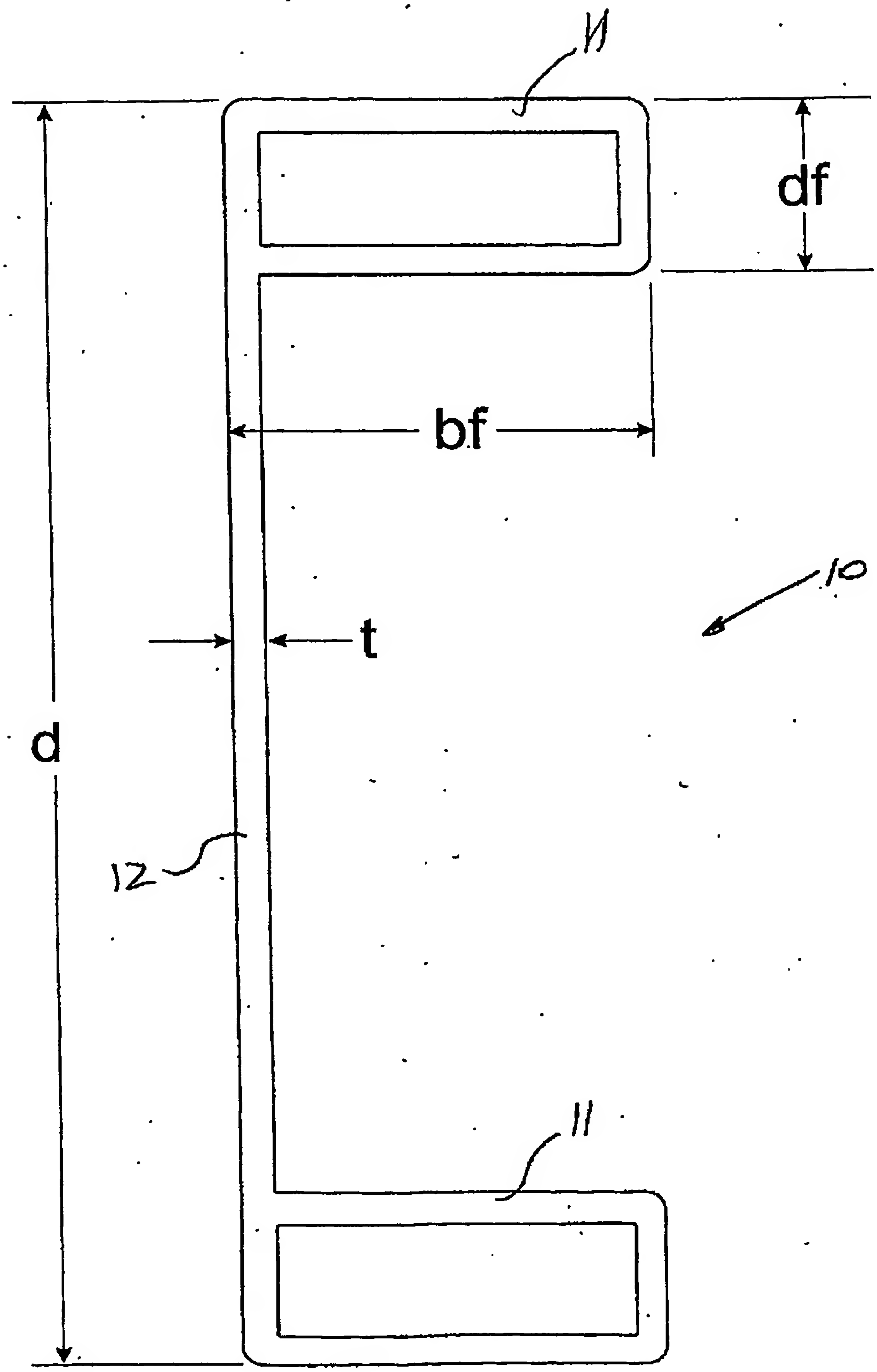

FIG 2